RECLAMATION

Managing Water in the West

User Needs for Improved Climate, Weather and Hydrologic Information:

Part 1: CCAWWG assessment motivation, approach and results overview

Levi Brekke (Reclamation, Research and Development, Acting Science Advisor)

NOAA's Climate Data Record Annual Meeting, 30 July 2013, Ashville, NC

U.S. Department of the Interior
Bureau of Reclamation

RECLAMATION
Managing Water in the West

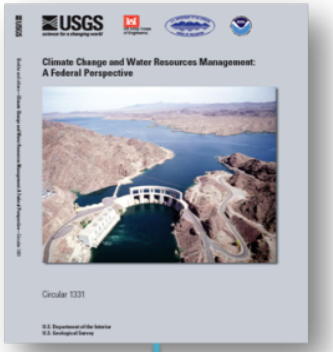
US Army Corps of Engineers

FEMA

USGS
science for a changing world

NASA

Climate Change and Water Working Group



Circular 1331

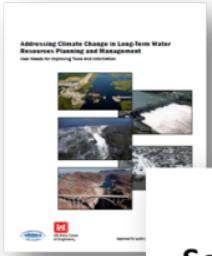
Facilitating Guidance Development (e.g., host workshops)

Identifying User Needs and Strategizing Science Response

- **Nonstationarity**

- **Portfolio of Approaches**

- **Long-Term Horizon**



Science Strategy

- **Short-Term Horizon**

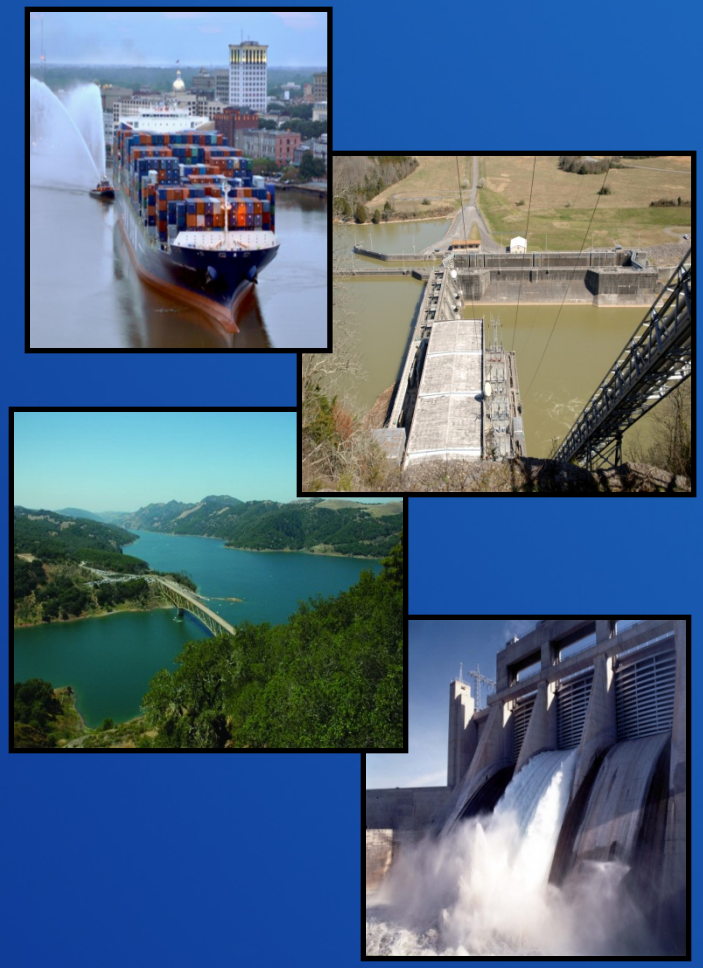
This Report

Science Strategy

Identifying User Needs for better short-term hydroclimate information

- "Short-Term Water Management Decisions: User Needs for Improved Climate, Weather, and Hydrologic Information"
  - 7 January 2013
  - Climate Change and Water Working Group activity (www.ccawwg.us)

- Authors
  - David Raff (lead, USACE)
  - Levi Brekke (Reclamation)
  - Kevin Werner (NOAA-NWS)
  - Andy Wood (NOAA-NWS)
  - Kathleen White (USACE)



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Hydrologic Monitoring and Prediction helps us anticipate, prepare for and manage through extremes.

New York Times
October 2010

October 18, 2010, 2:05 PM

Lake Mead Hits Record Low Level

By FELICITY BARRINGER

Jim Wilson/The New York Times

Bleached rock indicating a former high-water mark on outcroppings surrounding Lake Mead.

vater level in
lls the taps of
er than it ever

Salt Lake City Tribune
June 2011

(Jeremy Harmon | The Salt Lake Tribune) A fence post pokes up through the water as floodwaters rise along the Sevier River Saturday.

Hope fades for Utah orderly spring runoff; farmland underwater

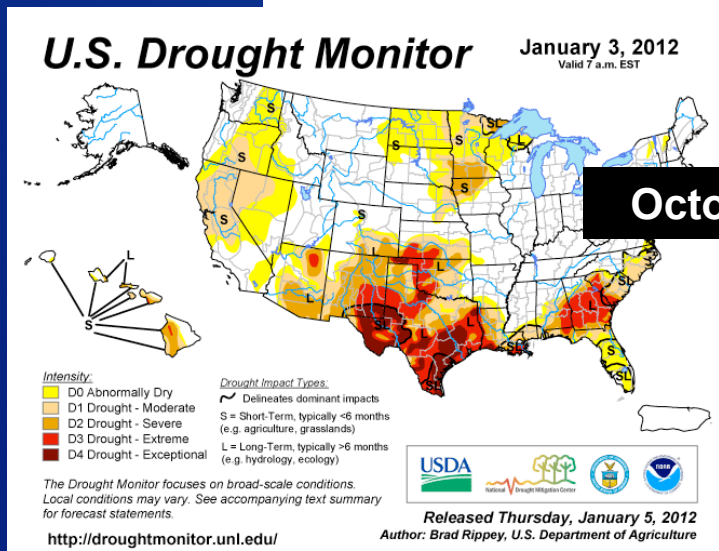
Mountains' snowpack remains massive; more rain forecast for Monday, then high temps.

BY BRIAN MAFFLY
AND ERIN ALBERTY
THE SALT LAKE TRIBUNE
First published May 29 2011 01:04PM
Updated Jun 13, 2011 01:25AM

Tweet 16 +1 0 Like 45

Ogden Canyon • For the past few days, the usually docile Ogden River has been tearing past the dining decks at Keith and Belinda Rounkles' restaurant, The Oaks, a mile below where it disgorges from the 74-year-old dam holding back Pineview Reservoir.

October 2010



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Short-term Operations: They're interconnected (1) address different objectives, (2) made at different time-resolutions, (3) revisited on different update cycles.

Fine Resolution
(Duration: hours to days)

- Objectives addressed at this Resolution: emergency response, flood risk management, hydropower, navigation

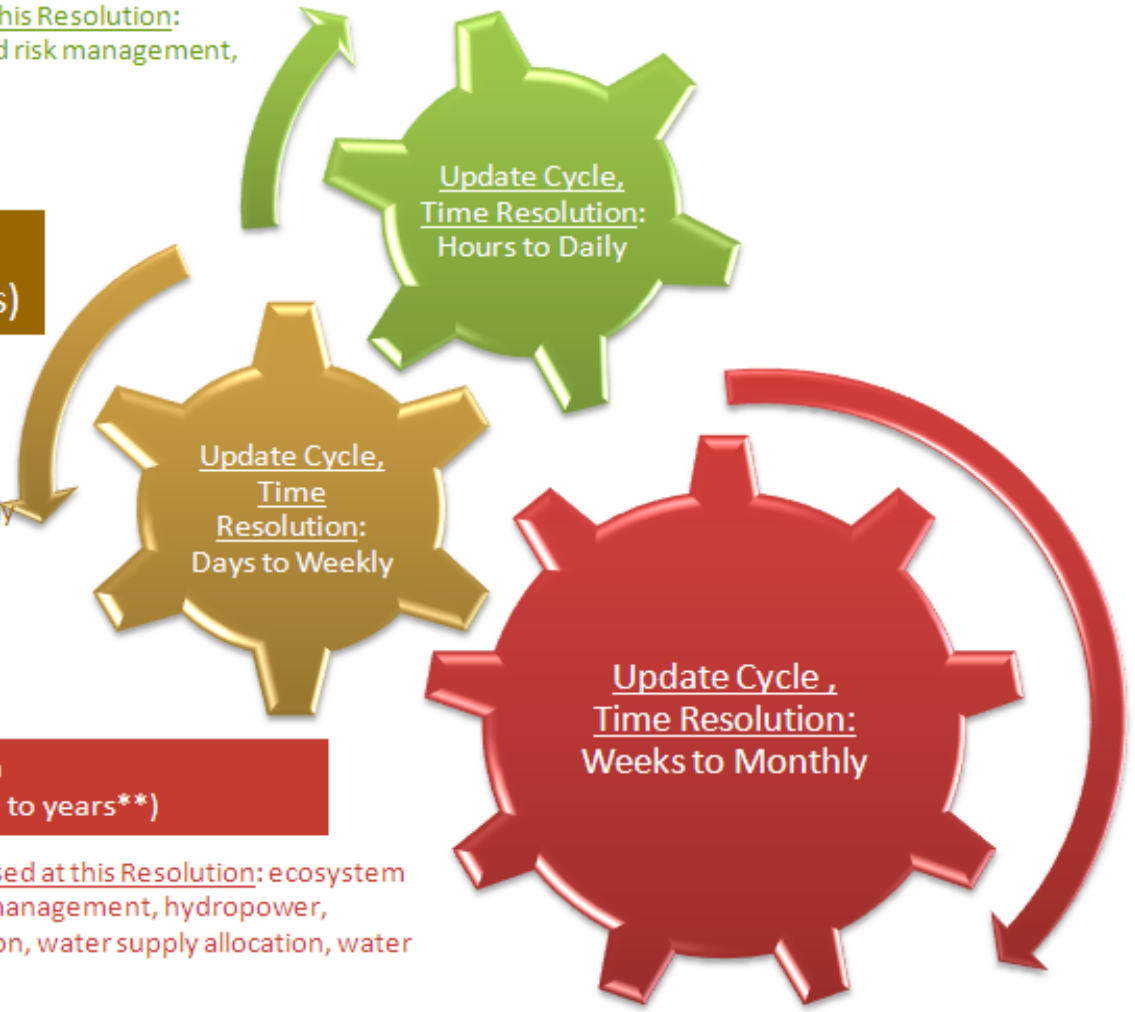
Medium Resolution
(Duration: days to weeks)

- Objectives addressed at this Resolution: ecosystem support, emergency response, flood risk management, hydropower, navigation, recreation, water supply conservation (e.g., snowmelt management), water delivery

Coarse Resolution
(Duration: seasons to years**)

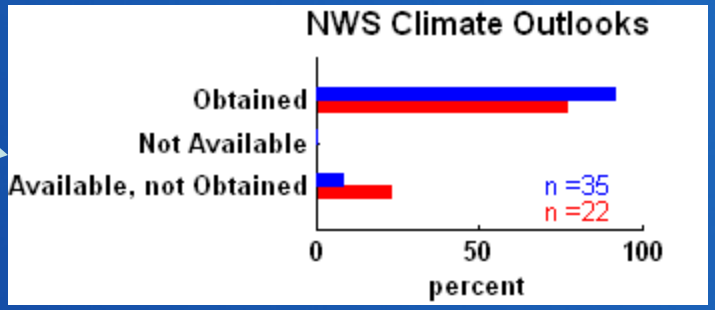
- Objectives addressed at this Resolution: ecosystem support, flood risk management, hydropower, navigation, recreation, water supply allocation, water delivery

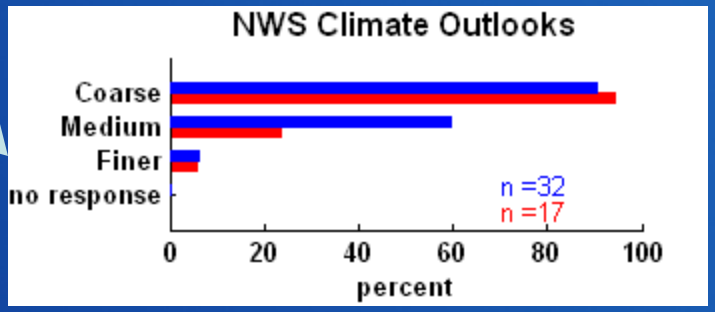
*** Most systems prepare outlooks having a duration of one-year or less.*

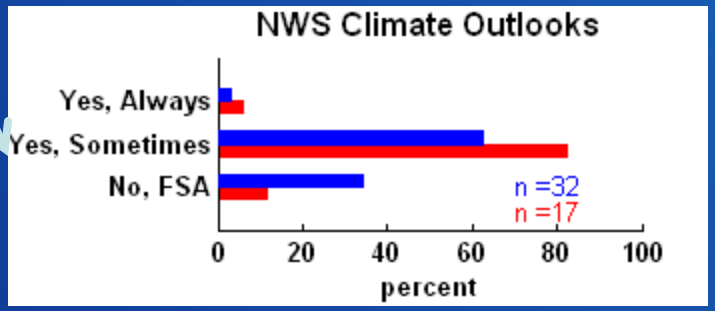


Use and Needs Assessment: Questions

- What do we use?
  - Was the product obtained?
  - For cases where the product was obtained, for which outlook resolution(s) does it apply?
  - … and does it influence outlook-related Decisions?
- What other products have we piloted, but did not adopt?
- Wish List: new products or services?







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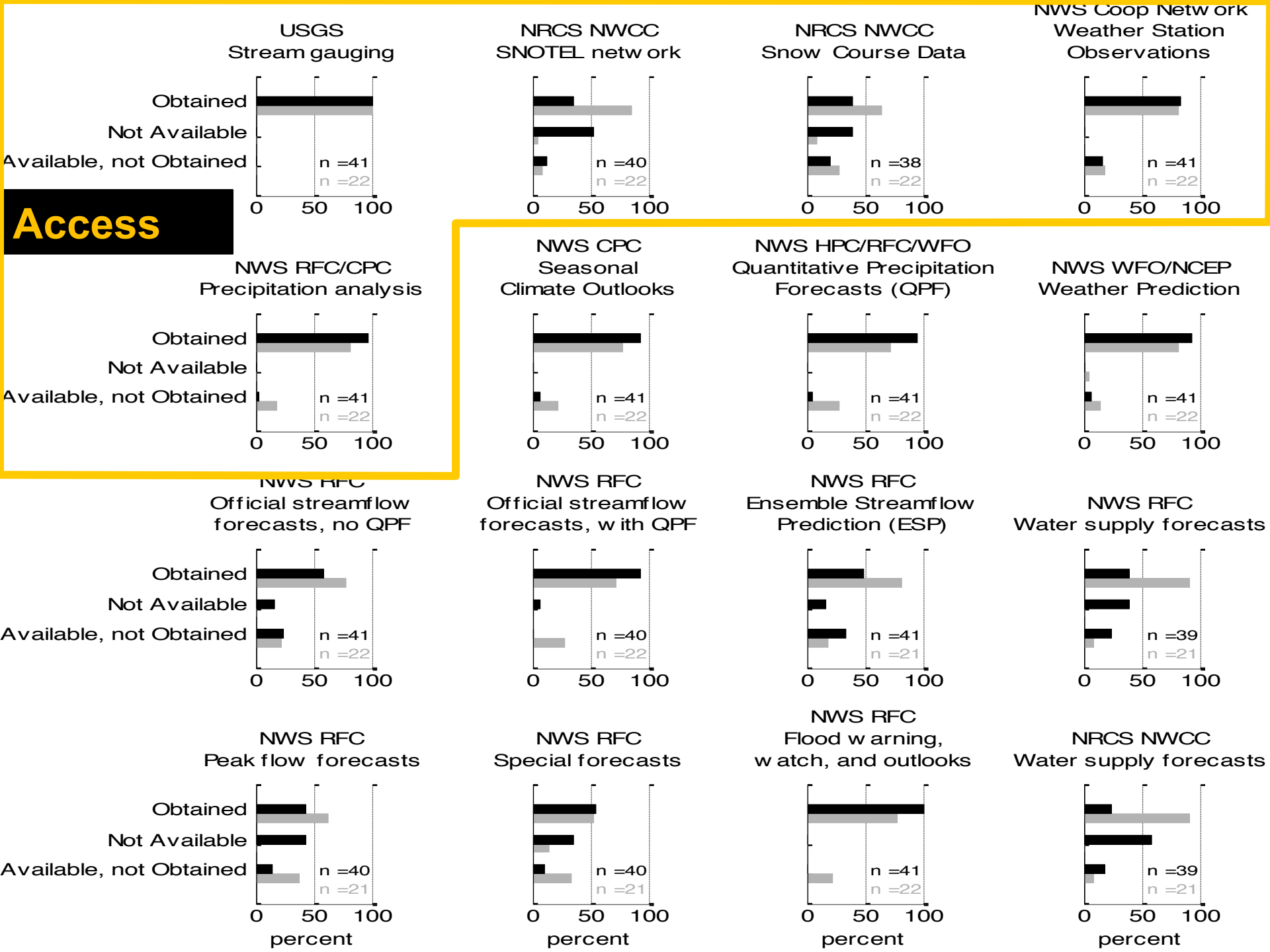
Use and Needs Assessment: Distribution

- Ask USACE & Reclamation operations units about their use of NWS, NRCS and USGS products
  - 16 products considered, monitoring to prediction
  - USACE: 41 responses (all Divisions represented)
  - Reclamation: 22 responses (all Regions represented)

Access


USGS
Stream gauging
NRCS NWCC
SNOTEL network
NRCS NWCC
Snow Course Data
NWS Coop Network
Weather Station
Observations
NWS RFC/CPC
Precipitation analysis
NWS CPC
Seasonal
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NWS HPC/RFC/WFO
Quantitative Precipitation
Forecasts (QPF)
NWS WFO/NCEP
Weather Prediction
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Official streamflow
forecasts, no QPF
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Official streamflow
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Ensemble Streamflow
Prediction (ESP)
NWS RFC
Water supply forecasts
NWS RFC
Peak flow forecasts
NWS RFC
Special forecasts
NWS RFC
Flood warning,
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NRCS NWCC
Water supply forecasts
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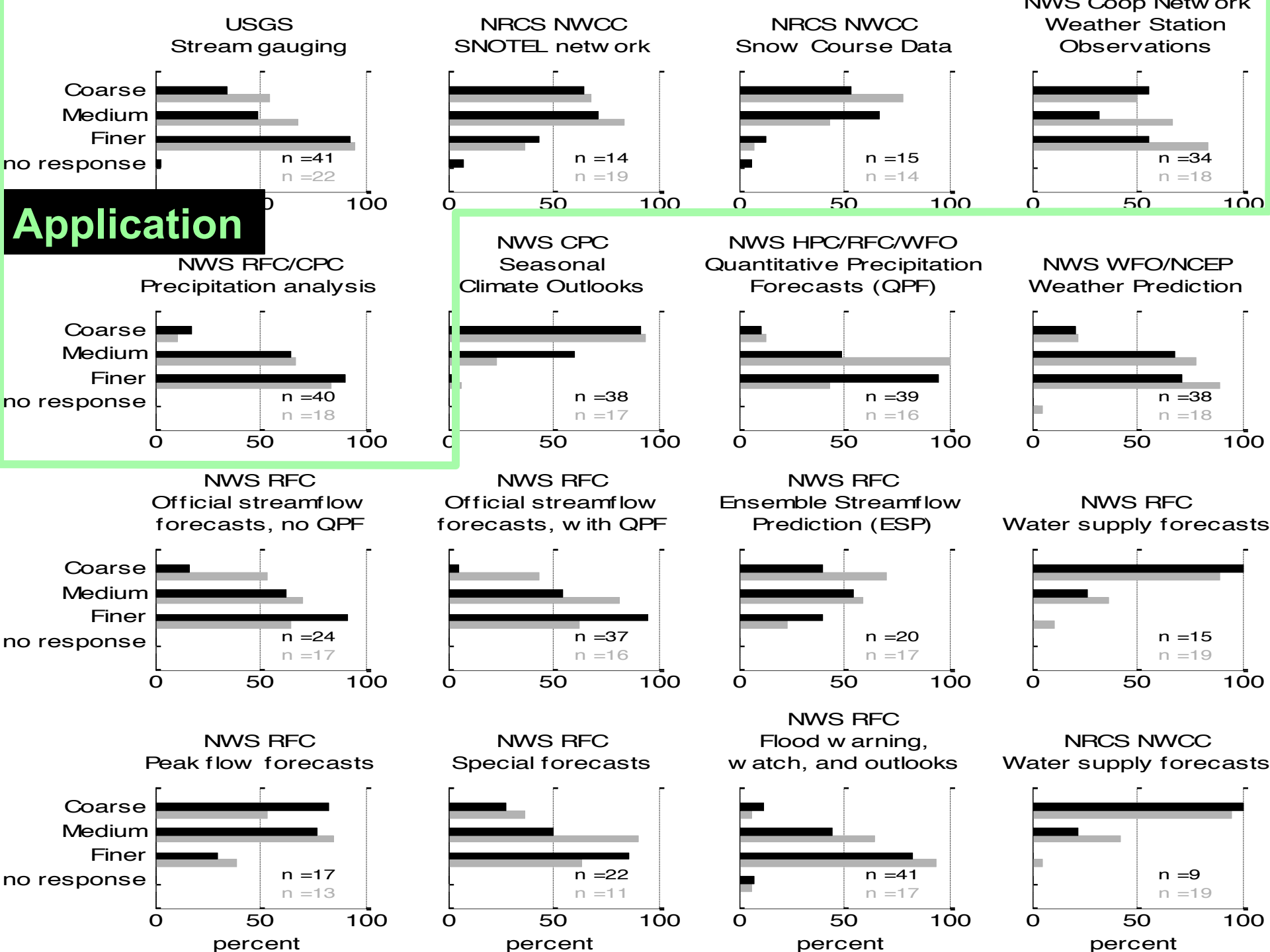
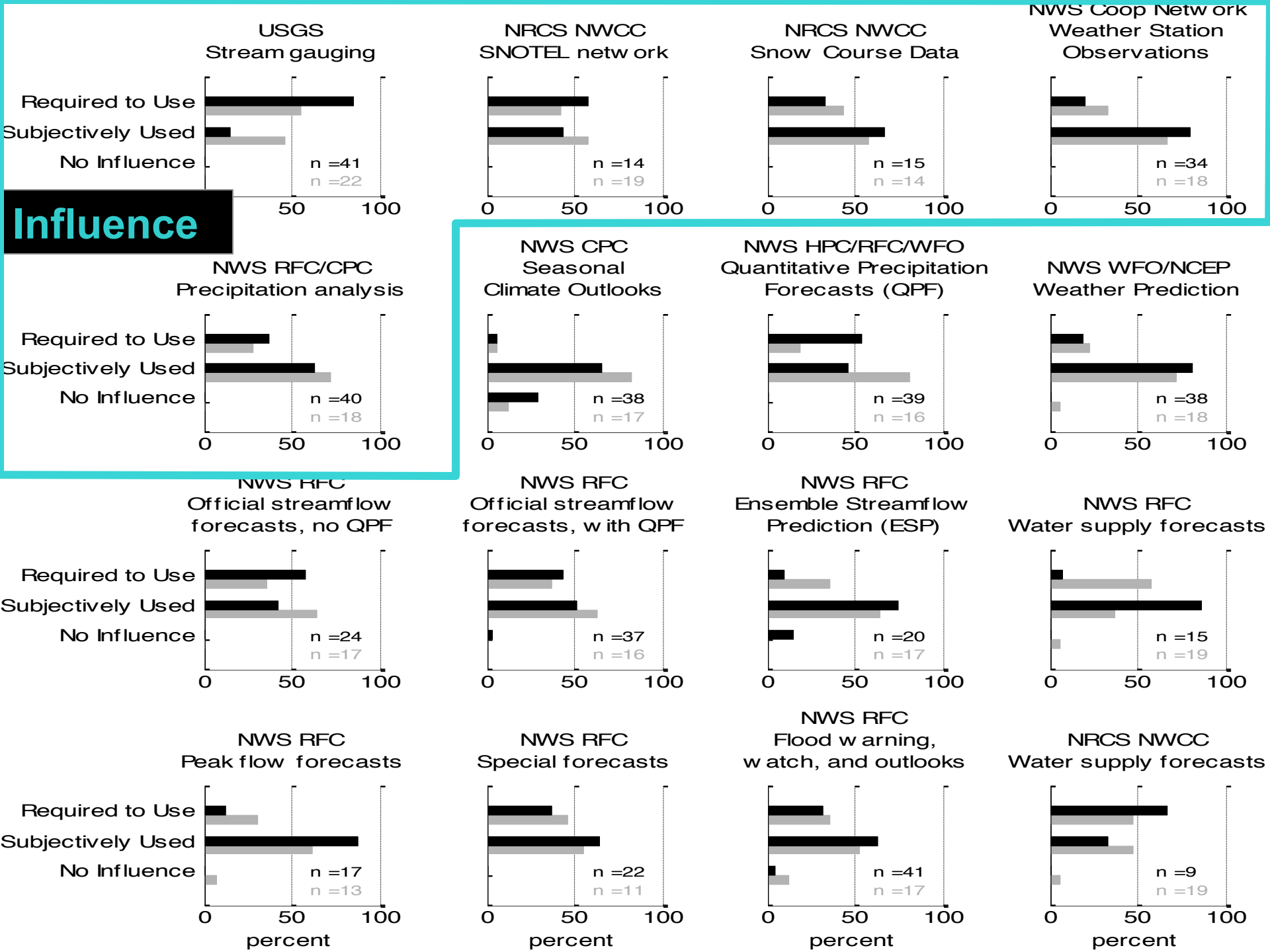
Application




Influence
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Analysis of Needs

- Needs grouped under four themes:

1. Monitoring
2. Forecasting
3. Understanding on Product Relationships and Utilization in Water Management
4. Information Services Enterprise

Summary of Needs: Forecasting

Sub-Category	Label	Need Statement
General	F1	Enhanced suite of hydrologic predictions spanning lead -times of days to seasons and consistent with the continuum of weather to climate forecast products.
Precipitation, supporting Fine Resolution Outlooks	F2	More reliable quantitative precipitation forecasts (QPF) on lead times of hours to days.
	F3	Improved precipitation forecasts for landfalling storms in coastal areas.
Streamflow, supporting Fine Resolution Outlooks	F4	Enhanced streamflow predictions on lead times of hours to days, particularly during storm events.
Streamflow, supporting Med. Resolution Outlooks	F5	Enhanced streamflow predictions on lead times of days to weeks, particularly during the snowmelt season
Runoff Volume, supporting Coarse Resolution Outlooks	F6	Improved anticipation of runoff volumes during lead times of months to seasons.
Water Level	F7	Enhanced prediction products characterizing potential water levels during storm events.
Other Hydroclimate	F8	Multi-variate suite of climate to hydrologic predictions that comprehensively characterizes the state and evolution of basin hydrologic conditions on lead times of days to seasons.

Summary of Needs: Monitoring

Sub-Category	Label	Need Statement
General	M1	Sustained support for monitoring networks that provide observations of weather and hydrologic conditions.
Precipitation	M2	Expanded networks of weather stations in water management regions that are currently served by relatively low station density.
Snowpack	M3	More interactive snow analysis products characterizing basin-distributed snow-covered area and snow-water equivalent
	M4	Expanded networks of snow-observing stations in the Central and Eastern United States.
Streamflow	M5	Preserving and expanding networks of streamflow observations with a focus on streams and rivers that are currently ungauged.